

REMARKS/ARGUMENTS

Reconsideration of this application is requested. Claims 1-3 and 5-13 remain in the application.

In Section 2 of the Detailed Action portion of the Office Action, Claims 1, 2, 5, 6 and 9-13 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Aisenbrey (US 2002/0109634 A1) in view of Sanz et al. (US 2004/0262453 A1) and further in view of Rivera et al. (US 6,047,925).

Regarding claims 1, and 12, Aisenbrey (FIG. 10A) was cited as teaching a conformal load-bearing antenna assembly, comprising: a pan 108 shaped to fit within an aircraft window opening (see paragraph [0052]); an antenna element 110 disposed within the pan (see FIG. 10A); and a connection for coupling a signal to the antenna element. The Office Action states that Aisenbrey does not explicitly disclose a radio frequency connector mounted in the pan. However, the Office Action further states that it is inherent that in order for the antenna to perform its function, a connector is required for connecting a signal to the antenna.

The Office Action further states that Aisenbrey does not disclose a pan providing structural rigidity as claimed. However, Sanz et al. was cited as teaching that a pan providing structural rigidity is widely used in the art (Sanz et al., paragraph [0021]). According to the Office Action, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide Aisenbrey's antenna system with a pan providing structural rigidity, as taught by Sanz et al. in order to have a good antenna structure.

The Office Action also states that Aisenbrey and Sanz et al. do not explicitly disclose a conductive gasket positioned adjacent to the perimeter of the antenna element, electrically bonding the antenna to an aircraft fuselage and providing a pressure seal. However, Rivera et al. was cited as teaching that such a conductive gasket is well known in the art (referring to col. 3, lines 4-7). According to the Office Action, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide Aisenbrey's antenna system with a conductive gasket, as taught by Rivera in order to have a good antenna structure.

The Applicants traverse this rejection and respectfully submit that the Office Action has failed to establish a prima facie case of obviousness. To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on Applicants' disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

The Office Action fails to meet all three of these criteria. Taking the criteria in reverse order, the Applicants respectfully submit that the references do not teach or suggest all the claim limitations. In particular, with respect to claim 1, the references do not teach a conformal load-bearing antenna assembly that includes (among other things) a pan providing structural rigidity and shaped to fit within an aircraft window opening.

Referring to specific elements of claim 1, the Office Action cites Aisenbrey as showing a conformal load-bearing antenna assembly. However, the Applicants respectfully submit that Aisenbrey does not disclose a conformal load-bearing antenna assembly. Aisenbrey discloses antennas fabricated from conductive loaded resin-based materials (see paragraph [0012]). Conductive loaded resin-based materials are defined in paragraph [0016] of Aisenbrey to be resins loaded with conductive materials to provide a resin-based material, which is a conductor rather than an insulator. While Aisenbrey further states that the resins provide the structural material which, when loaded with micron conductive powders or micron conductive fibers, become composites, which are conductors rather than insulators, the Applicants respectfully submit that these structural materials are not load-bearing structures. In fact, in paragraph [0038] Aisenbrey states that the structural resin can be a polyester that can be used to realize a cloth antenna. Such a cloth antenna would clearly not be a load-bearing structure.

With respect to the pan, the Office Action further states that Aisenbrey teaches a pan 108 shaped to fit within an aircraft window opening (see paragraph [0052]); and an antenna element 110 disposed within the pan (see FIG. 10A). However, the Applicants respectfully submit that Aisenbrey does not disclose a pan. Item 110 of Aisenbrey is a molding. Moldings are typically placed around the perimeter of windows. A pan is a shallow open container. As stated in the Applicants' specification at paragraph [0020], the pan forms a cavity that is positioned behind the antenna to form a cavity backed antenna. A cavity backed antenna includes an antenna element in a cavity that includes a back. The combination of an antenna element with the molding of Aisenbrey would not form a cavity backed antenna. Thus the Applicants respectfully submit that the molding of Aisenbrey is not a pan and is not equivalent to a pan.

The pan of the Applicants' invention serves several functions listed in paragraph [0034] of the present application, including: as a housing for the antenna element, as a mount for the RF connector to the transmitter/receiver coaxial cable, and as a pressure seal over the fuselage window opening. The pan of the Applicants' claim 1 also serves as a pressure plug to seal the window opening. The molding of Aisenbrey does not seal the window opening. Furthermore, the molding of Aisenbrey has a large central opening and therefore cannot serve as a pressure plug.

The Applicants further respectfully submit that Sanz et al. does not disclose or suggest the use of a pan or the use of a pan that provides structural rigidity. In FIG. 2, Sanz et al. shows a rigid panel 12 that replaces the function of a window frame. The rigid panel extends around the perimeter of an opening and forms a large central opening. The combination of an antenna element with the rigid panel of Sanz et al. would not form a cavity backed antenna.

The Applicants further respectfully submit that Rivera et al. does not disclose or suggest the use of a conductive gasket that provides a pressure seal. While Rivera et al. shows a conductive gasket as item 11 in FIG. 2, Rivera et al. does not disclose or suggest the use of a gasket that provides a pressure seal. There is nothing in Rivera et al. to indicate that any pressure differential exists across the gasket, and Rivera et al. does not say anything about the use of the gasket to form a pressure seal.

Under the second criteria for establishment of a prima facie case of obviousness, there must be a reasonable expectation of success. However, there is nothing in the teachings of Aisenbrey, Sanz et al. and/or Rivera et al. to indicate that an antenna assembly that can successfully replace a window plug would result from a combination of their teachings. More specifically, there is nothing in the cited references to indicate that selected portions of their structures can be combined to produce a successful window plug antenna.

Furthermore, the antenna assembly of the present invention is designed to withstand the structural loads previously withstood by a window. Aisenbrey and Rivera et al. say nothing about the structural loads that would be imposed on their antenna assemblies, and Sanz et al. only shows the use of a frame that can replace a window frame. The pan of the present invention provides the required rigidity for an antenna structure that fits within a window opening. Aisenbrey neither discloses nor suggests that his antenna can provide the necessary structural rigidity, and in fact, Aisenbrey specifically teaches away from this aspect of the Applicants' invention by providing a cloth example. The panel of Sanz et al. does not cover the window opening and therefore does not perform the same function as the pan of the Applicants' claim 1.

Finally, to establish a prima facie case of obviousness, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine reference teachings. The Court of Appeals for the Federal Circuit has repeatedly held that a "teaching or suggestion or motivation" to combine prior art references is an "essential evidentiary component" of any obviousness holding.

The Office Action states that it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide Aisenbrey's antenna system with a pan providing structural rigidity, as taught by Sanz et al. and the gasket of Rivera et al. in order to have a good antenna structure. However, the Applicants respectfully submit that there is nothing in the references that suggests that such a combination would produce a good antenna structure.

The Examiner has failed to show reasons that the skilled artisan, confronted with the same problems as the inventors and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed. It is only in hindsight in view of the Applicants' teachings that one skilled in the art would recognize that the combination of features in claim 1 would provide an antenna assembly that can serve as a substitute for a window plug.

Since claims 2 and 9 depend from claim 1, the rejections of claim 2 and 9 are traversed for the reasons set forth above with respect to the traversal of the rejection of claim 1, and for the following reasons. Claim 2 includes a stripline supported by a dielectric sheet, and at least one radiating element coupled to the stripline. The Applicants respectfully submit that the cited references do not show a stripline supported by a dielectric sheet, and at least one radiating element coupled to the stripline. Claim 9 specifies that the antenna element comprises a tapered stripline. A tapered stripline, such as item 92 in FIG. 9 of the present application, becomes progressively smaller toward one end. The Applicants respectfully submit that the cited references do not show a tapered stripline. With respect to claims 2 and 9, the Office Action refers to an abstract, but it is not clear what abstract it is talking about.

Claims 5, 6, 10, 11, and 13 add additional features to claim 1, including: the pan forming a pressure seal with the aircraft window opening; a cavity behind the antenna element; a pressure seal over the window opening; the pan serving as a structural replacement for a window plug; and a bonding strap for carrying lightning currents from the antenna structure to a fuselage of the aircraft which Aisenbrey does not explicitly disclose. However, according to the Office Action, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a pressure seal in order to hold the window from blowing away; and a bonding strap because a conventional airplane would have a mechanism to handle lightning or thunder to prevent electrical damage to the on board electronics, such as cockpit instruments.

Since claims 5, 6, 10, 11, and 13 depend from claim 1, the rejections of claims 5, 6, 10, 11, and 13 are traversed for the reasons set forth above with respect to the

traversal of the rejection of claim 1, and for the following reasons. With respect to claim 5, the Applicants respectfully submit that the cited references neither disclose nor suggest an antenna assembly that fits in a window opening. Thus the references neither disclose nor suggest the use of a pan to form a pressure seal with the aircraft window opening.

Regarding claim 6, the Applicants respectfully submit that the references neither disclose nor suggest a bonding strap for carrying lightning currents from the antenna structure to a fuselage of the aircraft.

Regarding claim 10, the Applicants respectfully submit that the references neither disclose nor suggest a cavity behind the antenna element.

Regarding claim 11, the Applicants respectfully submit that the references neither disclose nor suggest that the pan is a structural replacement for a window plug.

Regarding claim 13, the Applicants respectfully submit that the references neither disclose nor suggest a pan that forms a pressure seal over a window opening.

In Section 3 of the Detailed Action portion of the Office Action, claims 3 and 7-8 have been objected to as being dependent upon a rejected base claim, but allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. However, in view of the above remarks, such rewriting is not believed to be necessary.

All claims in the application are believed to be in allowable form. Allowance of the application is requested.

Respectfully submitted,

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